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**ABSTRACT****ALTERNATIVE SUBSTRATES FOR EPITAXIAL GROWTH**

A substrate including a base substrate, an interfacial bonding layer disposed on the base substrate, and a thin film adaptive crystalline layer disposed on the interfacial bonding layer.

- 5 The interfacial bonding layer is solid at room temperature, and is in liquid-like form when heated to a temperature above room temperature. The interfacial bonding layer may be heated during epitaxial growth of a target material system grown on the thin film layer to provide the thin film layer with lattice flexibility to adapt to the different lattice constant of the target material system. Alternatively, the thin film layer is originally a strained layer having a strained lattice constant
- 10 different from that of the target material system but with a relaxed lattice constant very close to that of the target material system, which lattice constant is relaxed to its relaxed value by heating the interfacial bonding layer after the thin film layer is removed from the first semiconductor substrate, so that the thin film layer has an adjusted lattice constant equal to its unstrained, relaxed value and very close to the lattice constant of the target material system.